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PATENT 10/21/03

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No. : 09/917,859
Applicant : SHIGEOKI KAYAMA ET AL.
Filed : JULY 31, 2001
TC/A.U. : 3683
Examiner : Robert SICONOLFI

Confirmation No. : 9469

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GROUP 3600

Docket No. : 313KA/50252
Customer No. : 23911

Title : DRIVE UNIT FOR WHEEL AND ASSEMBLY METHOD FOR THE
SAME

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

SUPPLEMENTAL REPLY AFTER FINAL

Sir:

This Reply supplements the Reply filed on June 12, 2003.

The following remarks are respectfully submitted in response to the Office Action dated March 12, 2003.

In view of the Advisory Action dated June 25, 2003, Applicants would like to clarify their arguments against the rejections under 35 U.S.C. §103(a).

In the Office Action dated March 12, 2003, claims 1-5 and 7-9 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Hoffman* (U.S. Patent 5,674,011). According to the Office Action, *Hoffman* discloses all limitations of the rejected claims except the limitation regarding the clearance width or angle ranges. However, the Examiner stated, citing MPEP § 2144.05 and § 716.02, contended that it would have been obvious to use the claimed clearance ranges as they are merely optimization based on routine experimentation.

Applicants would like to reiterate that one of the differences between the claimed invention and *Hoffman* is that while the claimed invention uses a clearance fit for the spline connection, *Hoffman* does not disclose the use of a clearance fit for the spline connection. In fact, *Hoffman* makes no mention of the fit used by its spline connection. Since *Hoffman* does not disclose the limitation, it cannot render the limitation of using a clearance fit for the spline connection obvious, let alone the more narrow limitation of using a clearance fit within a certain range.

Applicants respectfully submit that the Examiner's reliance on MPEP §2144.05 is misplaced. In each of the cases cited in MPEP §2144.05, the only difference between the claimed invention and the cited art is the claimed range. In contrast, in the present case, the differences between the claimed invention and the cited art are (1) the use of a clearance fit for the spline connection and (2) a range for the clearance fit. In other words, the difference between the claimed invention and the cited art is not only the claimed range for the clearance fit but also the clearance fit itself. Therefore, the claimed range for a clearance fit is not merely an optimization based on routine experimentation, because it involves (1) the use of a clearance fit and then (2) a range within which the clearance fit is limited.

Applicants would like to point out that "interference fit," which is the opposite of "clearance fit," is widely used in prior art wheel drive units because it has the advantage of eliminating backlash and rattling noise. For example, Paragraph 12 of Japanese Patent Publication No. 2002-36810 states that "the side faces of the teeth of the male and female splines 38, 39 are pushed to each other at the axial opposite ends in the state where the bearing unit for vehicle wheel support 1a is connected to the constant velocity joint 2a, and so teeth-rattling noise is prevented from occurring during automobile running." The sentence that "the side faces of the teeth of the male and female splines 38, 39 are pushed to each other

at the axial opposite ends” means that an interference fit is used. A copy of the Japanese Publication and an English translation of its Paragraphs 2-12 are attached for the Examiner’s reference.

Although it is not necessary to overcome the rejection, Applicants would like to point out that contrary to the prior art teaching cited above that a clearance fit between the spline members of a wheel drive unit’s hub and drive members generates noise, Applicants discovered the unexpected result that an clearance fit can be used with minimum rattling noise if the clearance fit is within a certain range. This result is not taught or suggested by any of the references cited by the Examiner.

In conclusion, the claimed invention cannot be rendered obvious by *Hoffman* because *Hoffman* not only fails to disclose the use of a clearance fit for the spline connection but also fails to disclose a range for the clearance fit. In addition, although unexpected result is not required to overcome the rejection, Applicants would like to point out that the claimed invention achieves the unexpected result that a clearance fit between the splines members of a wheel drive unit’s hub and drive members does not generate significant rattling noise if it is limited within a certain range.

The Examiner also rejected claims 1-4 and 6-9 under 35 U.S.C. §103(a) as being unpatentable over prior art Figure 8 on the same ground as cited in the rejection of claims 1-5 and 7-9 over *Hoffman*. For the same reasons as set forth above, Applicants respectfully submit that claims 1-4 and 6-9 are unpatentable over prior art Figure 8.

In light of the foregoing remarks, this application is considered to be in condition for allowance, and early passage of this case to issue is respectfully requested. If there are questions regarding this amendment or the application in general, a telephone call to the

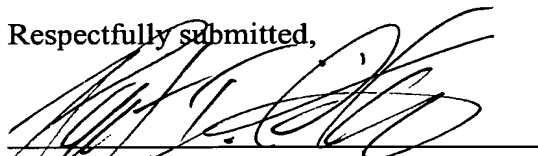
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Supplemental Reply dated September 11, 2003
Response to Office Action dated March 12, 2003

undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and any deficiency in fees should be charged, or any overpayments should be credited, to Deposit Account No. 05-1323 (CAM #: 038920.50252US).

September 12, 2003

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'H. I. Cantor', written over a horizontal line.

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